NASA STTR 2012 Phase I Solicitation

T11.01   Software Framework & Infrastructure Development of Spaceborne Hybrid Multicore/FPGA Architectures

Lead Center: GSFC

Participating Center(s): ARC, JPL, KSC

Future high-performance on board computing systems will likely employ hybrid architectures consisting of both advanced multi-core processors and reconfigurable Field Programmable Gate Arrays (FPGAs), which may include additional embedded hard and/or soft core processors along with processing functions implemented in the FPGA logic. Advanced software architectures, software infrastructure elements and software design tools are needed to compliment these advanced hardware platforms and enable their efficient/effective use. The intent of this subtopic is to develop these software architectures, infrastructure elements and tools.

Desired technologies include multi-core software frameworks, multi-core operating system components, hardware/software abstraction layers & interfaces, and development systems/tools/simulators. Additionally, middleware/hypervisors are needed that can perform memory protection and run-time allocation of tasks to processing resources, and address performance optimization, energy management, and fault mitigation.